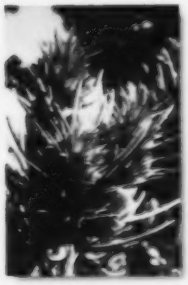

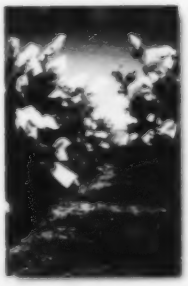

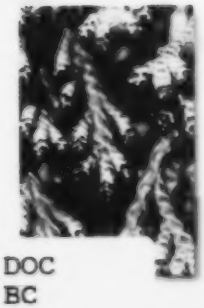

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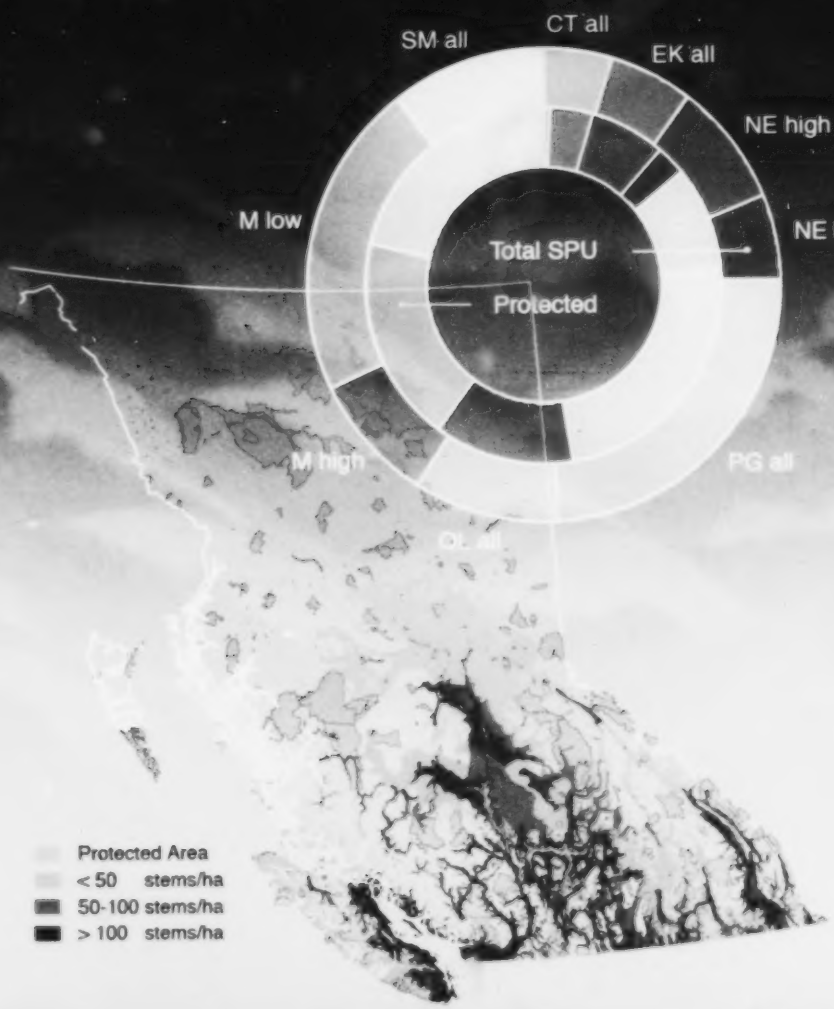

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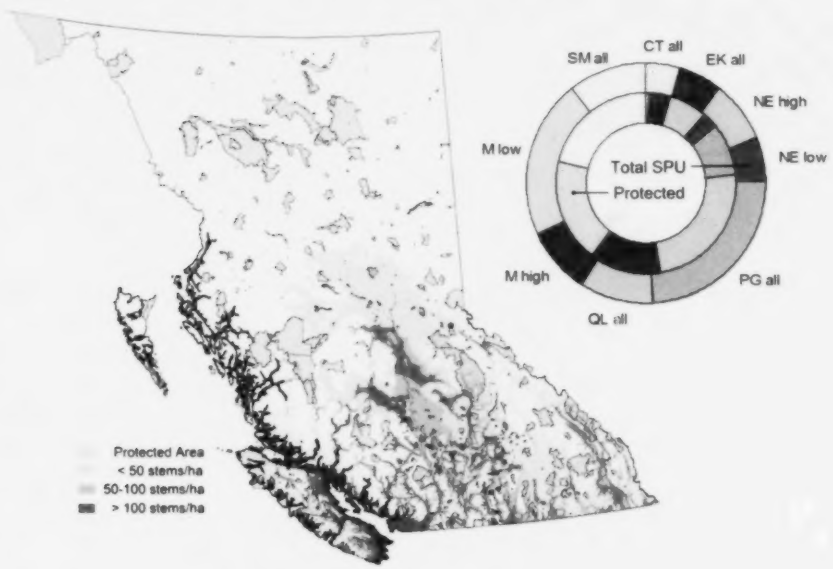
Cover Figure

The title page image is an illustration of the gap analysis methodology used to evaluate the *in situ* conservation status of all 49 forest tree species in British Columbia. The inner circle visualizes the proportion of protected populations relative to the total resource (outer circle and map) by ecosystem for Douglas-fir.



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Acknowledgements

This Annual Report presents the 2004/05 achievements of the many people involved with tree improvement and forest genetics in British Columbia.

FGC Co-Chairs Shane Browne-Clayton and Dale Draper are thanked for their guidance throughout the year.

Technical Advisory Committee Chairs provided important guidance to all subprograms, and are acknowledged for their efforts. They are Sally Aitken (Coastal TAC), Mike Carlson (Interior TAC), Dave Kolotelo (Gene Conservation TAC), Chris Hawkins (Extension TAC), Robb Bennett (Orchard Pest Management TAC), and Leslie McAuley (Gene Resource Information Management Advisory Committee).

All members of the Forest Genetics Council and Technical Advisory Committees are thanked for their careful deliberations, contributions, and support. They are listed on the back page of this Annual Report.

My appreciation also goes to Roger Painter (FIA Tree Improvement Program Administrator) for his ongoing efforts, commitment, and cooperation.

Finally, the support and guidance of Provincial Chief Forester, Jim Snetsinger, and Acting Deputy Chief Forester, Henry Benskin, are instrumental in keeping this program on track. My thanks for their important contributions.

JACK H. WOODS
PROGRAM MANAGER
FOREST GENETICS COUNCIL
OF BRITISH COLUMBIA

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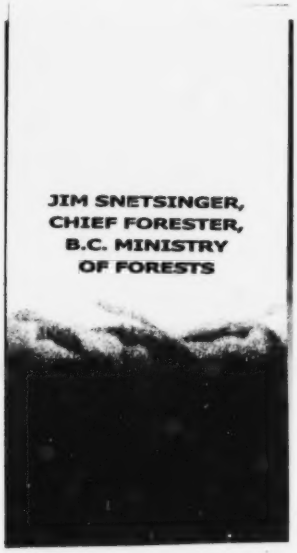


JIM SNETSINGER, CHIEF FORESTER, B.C. MINISTRY OF FORESTS

Message from the Chief Forester

I am pleased to participate in the fifth Annual Report of the Forest Genetics Council of BC (FGC), and the first annual report to be prepared under my tenure as Provincial Chief Forester.

Since taking over the position of Provincial Chief Forester in November, 2004, I have had the opportunity to sign into effect the new Chief Forester Standards for Seed Use, to attend a meeting of the Forest Genetics Council (FGC), and to become familiar with many of the people and operations related to gene resource management. My over-arching impression is that this area of forest management in British Columbia is very effectively and cooperatively managed under the guidance of the FGC. I have been impressed with the caliber of people involved, and the level of commitment shown.

In the third year of the Forest Investment Account (FIA) Tree Improvement Program, business practices guided by the FGC continue to efficiently deliver this important provincial program. The attention paid to business planning, performance indicators, and reporting have resulted in a great deal of support for tree improvement and all aspects of gene resource management, and have given FIA decision-makers confidence in Council's ability to produce results.

I am particularly pleased to see the progress made by the UBC Centre for Forest Gene Conservation, an initiative of Council, in the area of climate modeling, and of projecting the probable shifts of ecosystems, species ranges, and seed zones under various climate-change scenarios. This work is key to evaluating risk and climate-change response, and I look forward to continued progress.

During the coming year, the new Chief Forester Standards for Seed Use will guide the selection and deployment of seed used on Crown land. The Standards will simplify some aspects of seed use. Provision for Alternatives and Amendments to the Standards will also provide for practical and scientifically sound changes where appropriate.

Finally, I want to recognize the contribution of Shane Browne-Clayton for his work, insight, and guidance as Industry Co-Chair of Council since 1998. Shane's dedication to gene resource management, to good forestry, and to efficiency through a cooperative approach are commendable. He has done a great deal to bring this program to the level of organization and success it has achieved. Shane will be leaving Council during 2005, and I will be challenged to find a replacement with the same level of commitment.

During the coming year, I look forward to working with Council and those on affiliated committees, and to seeing further progress towards meeting long-term objectives.

Message from Forest Genetics Council Co-Chairs

SHANE BROWNE-CLAYTON, INDUSTRY CO-CHAIR

DALE DRAPER, MINISTRY OF FORESTS CO-CHAIR

Completion of the new Chief Forester Standards for Seed Use in November of 2004 culminated extensive work by Ministry of Forests and industry staff to draft, review, and ensure that practical and comprehensive standards are in place to guide forest gene resource management (GRM) over the coming years. In addition, a document outlining methods for estimating parental gamete contributions to orchard and vegetative seedlots was prepared. Although many aspects of these documents are unchanged from prior practice, they will provide a clear and documented framework for both operations and monitoring compliance.

The 2004/05 fiscal year was largely one of carrying out work towards objectives set out in the FGC Strategic Plan. With only a few minor exceptions, seed orchard capacity is now in place to meet Council targets, and the challenge to orchard managers is to continue to ramp up production and gain; particularly for lodgepole pine and interior Douglas-fir.

Increasing orchard seed yields will be aided by a new FGC initiative to decrease seed losses to pests. Through the planning efforts of the Pest Management Technical Advisory Committee, under the leadership of Dr. Robb Bennett, a strategy was developed to deliver pest management research, applied support, and operational control in a comprehensive and cooperative fashion among orchard operators and BC Ministry of Forests (MOF) staff. This effort was endorsed by Council, and 2005 will see the hiring of a seed pest management scientist in the MOF. We look forward to pest management solutions, and the resulting increases in orchard seed production.

The massive bark beetle outbreak in the BC interior is presenting huge challenges for forest management. Providing seed to support reforestation efforts, and adjusting to changing seed use patterns will be difficult in some seed planning units. This issue requires continued focus on creating an adequate seed supply and inventory that will be robust to near-term shifts in seed use patterns. While such production and inventory are largely available for interior spruce, we will be hindered by the lack of lodgepole pine seed for a number of years to come. However, through SelectSeed Company Ltd., orchards have now been established.

Finally, we would like to recognize and sincerely thank the many industry and government staff who contribute to the provincial gene resource management program for their cooperation and dedication over the past year. This base of support is consistent and solid, and is at the heart of the success realized by Council. We would also like to recognize the importance of financial support through Forest Investment Account Tree Improvement Program. This funding is instrumental to the success of many aspects of the GRM program, particularly tree breeding and research.

Forest gene resource management includes the conservation, controlled use, and enhancement of genetic resources of forest tree species.

1.0 Forest Gene Resource Management in British Columbia

Forest gene resource management (GRM) encompasses the conservation, controlled use, and enhancement of genetic resources of forest tree species, as well as related communication and extension activities. In British Columbia, GRM is a cooperative effort.

The Forest Genetics Council of British Columbia (FGC) coordinates a provincial GRM program that is implemented by stakeholders in the forest industry, Ministry of Forests (MOF), Canadian Forest Service (CFS), and universities.

In broad terms, the MOF leads tree breeding activities and both the MOF and private industry lead operational production of reforestation materials. The MOF Research Branch, universities, and CFS undertake research supporting tree improvement, while private institutions focus on applied research related to operational production. The University of British Columbia (UBC) leads gene conservation research, with input from all cooperators.

During the term of this report, the provincial Forest Investment Account Tree Improvement Program (FIA) was a major funding source for forest gene resource management in British Columbia. Industry, MOF, and university cooperators also contributed substantial resources.

This Annual Report describes progress on work outlined in the FGC Business Plan for 2004/05. The Business Plan and this Annual Report focus on FIA funding, although performance indicators used at both the project and provincial levels represent the combined effort of all cooperators and resources.

1.1 Forest Genetics Council of British Columbia

The FGC is a multi-stakeholder group representing the forest industry, MOF, Canadian Forest Service, and universities. Council's mandate is to champion forest gene resource management, to oversee strategic and business planning for a cooperative provincial forest gene resource management program, and to advise the province's Chief Forester on policies related to forest gene resource management.

The Council provides a forum for stakeholder representatives to set goals and objectives, and to oversee the development and delivery of business plans to fulfill them.[1]

> *"The Forest Genetics Council represents the B.C. forest industry, Ministry of Forests, Canadian Forest Service, and universities."*

As set out in the 2004 Strategic Plan, Council's goal is to:

Lead the cooperative management of tree gene resources in British Columbia consistent with scientific and conservation principles, by:

- *Increasing the average volume gain of select seed used for Crown land reforestation to 20% by the year 2020,*
- *Increasing select seed use to 75% of the provincial total sown by 2013,*
- *Supporting gene conservation research and the cataloguing of indigenous-tree genetic resources,*
- *Coordinating stakeholder activities and securing resources to meet Business Plan priorities, and*
- *Monitoring progress in all aspects of gene resource management.*

Business Planning

The annual FGC Business Plan outlines the activities and budgets of the seven subprograms that constitute the provincial forest gene resource management program.

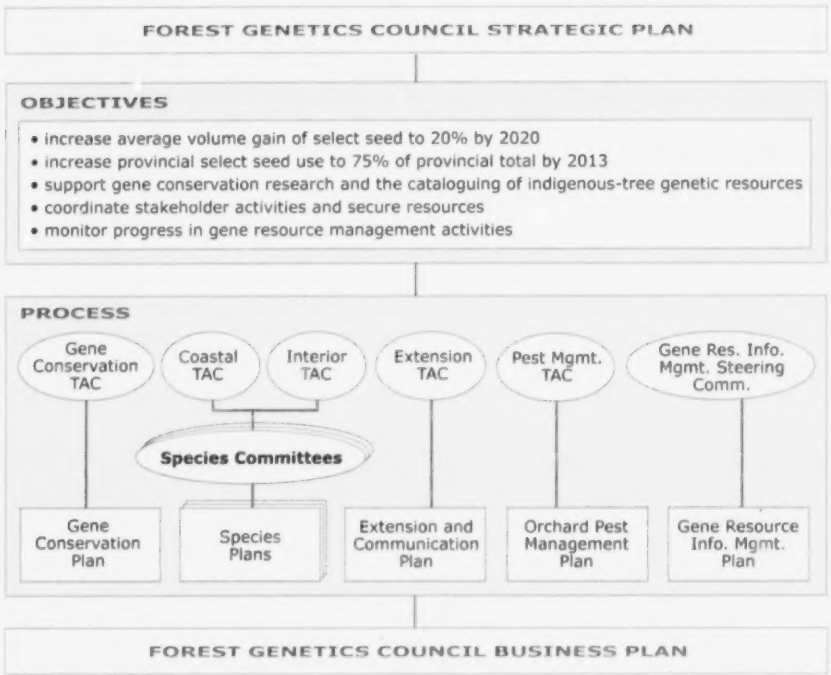
FGC Technical Advisory Committees (TACs) provide technical and policy information to Council and contribute to the development of annual plans and associated budgets to achieve FGC goals and objectives (Figure 1).

Each committee identifies priorities, and evaluates and ranks proposals and projects for funding through the Business Plan. Council reviews all strategies, plans, or recommendations from the TACs for approval (or revision) before they are included in the FGC Business Plan.

> *"Council's Technical Advisory Committees lay the groundwork for the annual FGC Business Plan."*

[1] For more information on the Forest Genetics Council, see *http://www.fgcouncil.ca.*

Figure 1
The link between FGC objectives, planning processes, and the FGC Business Plan.


FOREST GENETICS COUNCIL STRATEGIC PLAN
OBJECTIVES
• increase average volume gain of select seed to 20% by 2020
• increase provincial select seed use to 75% of provincial total by 2013
• support gene conservation research and the cataloguing of indigenous-tree genetic resources
• coordinate stakeholder activities and secure resources
• monitor progress in gene resource management activities
PROCESS
Gene Conservation TAC
Coastal TAC
Interior TAC
Extension TAC
Pest Mgmt. TAC
Gene Res. Info. Mgmt. Steering Comm.
Species Committees
Gene Conservation Plan
Species Plans
Extension and Communication Plan
Orchard Pest Management Plan
Gene Resource Info. Mgmt. Plan
FOREST GENETICS COUNCIL BUSINESS PLAN

1.2 Forest Investment Account Tree Improvement Program

"Council's Business Plan coordinates Forest Investment Account spending with cooperator investments and activities."

The Tree Improvement Program (TIP) is part of the provincially delivered Forest Investment Account. FIA promotes sustainable forest management in British Columbia, and includes three major objectives:

- foster sustainable forest management
- improve the public forest asset base
- promote greater returns from the utilization of public timber.

TIP investments are organized and managed by the FGC and its committees. Council business planning coordinates and leverages TIP investments with other cooperator investments.

Activities in the FGC Business Plan are organized into seven subprograms (Figure 2):

- Gene Conservation
- Tree Breeding
- Operational Tree Improvement (OTIP)
- Expansion of Orchard Seed Supply (SelectSeed Company Ltd.)
- Extension and Communication
- Gene Resource Information Management
- Seed Orchard Pest Management

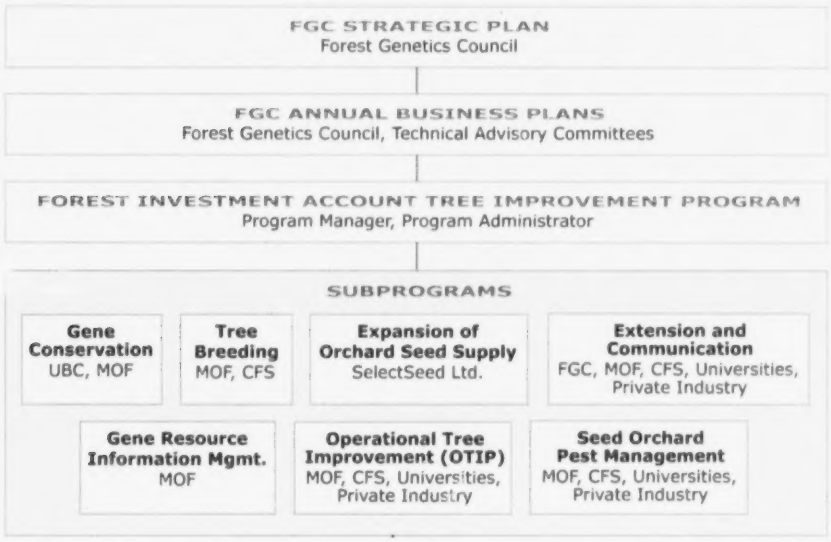


Figure 2
Relationship between FGC strategic and annual business plans, Forest Investment Account TIP, and participants in gene resource management activities.

> *FIA - TIP annual budgets are based on recommendations from the Forest Genetics Council.*

FIA Funding and administration

TIP annual budget allocations are based on recommendations from the FGC as developed in the FGC Business Plan, and are subject to the budgeting and approval processes of the Forest Investment Council and the Ministry of Forests.

During the 2004/05 fiscal year, the FIA-funded forest gene resource management activities identified in the FGC Business Plan were delivered through three administrative mechanisms:

- Ministry of Forests/UBC Contribution Agreement
- Direct Ministry of Forests Tree Improvement Branch Administration
- Ministry of Forests/SelectSeed Company Ltd. Multi-Year Agreement.

The subprograms associated with each of the agreements are shown in Figure 3.

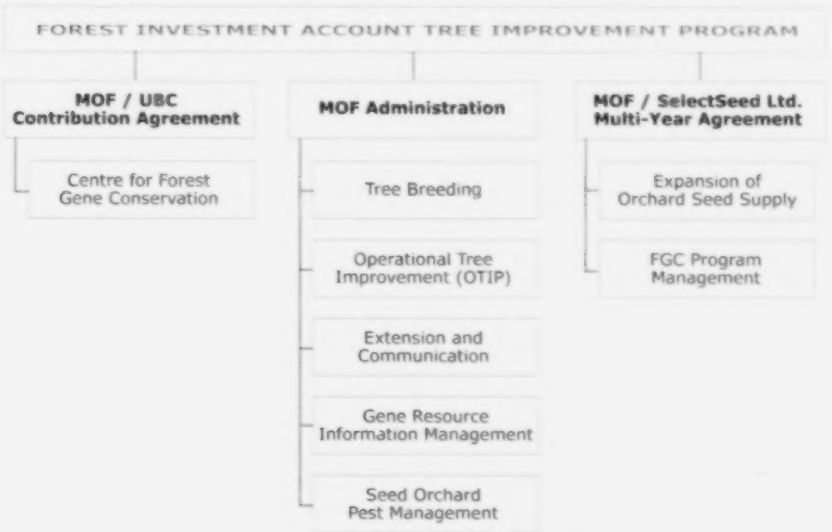

FOREST INVESTMENT ACCOUNT TREE IMPROVEMENT PROGRAM
MOF / UBC Contribution Agreement
Centre for Forest Gene Conservation
MOF Administration
Tree Breeding
Operational Tree Improvement (OTIP)
Extension and Communication
Gene Resource Information Management
Seed Orchard Pest Management
MOF / SelectSeed Ltd. Multi-Year Agreement
Expansion of Orchard Seed Supply
FGC Program Management

Figure 3
Funding agreements for the delivery of the FIA – TIP.

Monitoring and Reporting

Activities undertaken in the delivery of the FGC Business Plan are monitored for performance relative to specified criteria, and for progress towards long-term program objectives. Performance is planned, monitored, and reported using performance indicators (PIs). These indicators are logical measures of work such as "number of grafts made" or "number of ramets planted." The types of work are organized under a work breakdown structure (WBS) shown in Figure 4. PIs are not feasible for all types of work, and reports are written for technical support, gene conservation, extension, communication, and administrative activities.

> *Activities are monitored for performance and progress towards long-term program objectives.*

Figure 4
Work breakdown structure for program organization, management, and monitoring.

2.0 Forest Genetics Council and Committee Activity 2004/05

During the period of this report, the Forest Genetics Council met quarterly. In addition to subprogram progress reported below, the primary issues and activities included:

- developing a Business Plan and a Forest Investment Account Tree Improvement Program budget recommendation for the 2005/06 fiscal year;
- providing input to, and review of the *Chief Forester Standards for Seed Use*
- re-organizing the orchard pest management program;
- developing methods for estimating parental gamete contributions to seed and vegetative lots;
- providing direction to and receiving reports from committees;
- managing committee mandate, structure, and activities in support of objectives.

2.1 Coastal and Interior Technical Advisory Committees (CTAC and ITAC)

The CTAC met in October 2004. The ITAC and affiliated interior species committees met in Vernon and Prince George in November 2004. Principal activities for both committees included:

- reviewing species plan strategies and reports from affiliated Species Committees;
- reviewing ongoing and new research relevant to gene resource management;
- discussing reports from breeders and orchard operators;
- reviewing and commenting on aspects of the *Chief Forester's Standards for Seed Use* in the *Forest and Range Practices Act;*
- developing the OTIP project eligibility list.

2.2 SelectSeed Company Ltd. Board of Directors

The SelectSeed Board met in June and November 2004, and February 2005. Principal activities included:

- business planning for orchard development activities, and approval of a Business Plan for the 2005/06 fiscal year;
- receiving and approving audited financial statements for the 2003/04 fiscal year;
- addressing business items related to annual reporting requirements of the *Company Act;*
- developing a business analysis of cash flow, and policy related to seed pricing; and
- coordinating and updating of the principal contracts guiding orchard development and management activities.

2.3 Other Committees

- The **Extension TAC** met in May and November, 2004. Activities included review of projects, business planning for 2004/05, and the development of a client extension survey to evaluate extension needs.
- The **Gene Conservation TAC** met in February, 2005. Activities included review of projects and discussion of projects and budgets for 2005/06.
- The **Gene Resource Information Management Steering Committee** met in February 2005. Activities included updates on all projects by project leaders, discussion of projects and priorities for 2005/06, and development of a business plan framework for 2005/06.

3.0 FIA Tree Improvement Program 2004/05

3.1 Budgets and Expenditures

Forest Investment Account Tree Improvement Program allocations and expenditures for the 2004/05 fiscal year are shown in Table 1. The table does not include the in-kind, staff, and other substantial inputs by industry, MOF, and university cooperators who contribute to the success of gene resource management activities in B.C.

Table 1
Summary of Forest Investment Account TIP Subprogram budgets and expenditures for the period April 1, 2004 through March 31, 2005 ($ x 1000).

Subprogram	Budget ($)	Expenditures ($)
Gene Conservation	220	220
Tree Breeding	2,124	2,171
Operational Tree Improvement Program (OTIP)	697	666
Extension and Communication	126	121
Gene Resource Information Management	70	49
Seed Orchard Pest Management	150	142
Administration	33	33
Subtotal	**3,420**	**3,402**
Expansion of Orchard Seed Supply (SelectSeed Ltd.)	950	880*
Forest Investment Account Tree Improvement Program Contribution	**4,370**	**4,282**

* Actual audited expenditure; difference from budgeted amount carried forward to 2005/06.

3.2 Gene Conservation Subprogram

> *"Maintaining genetic diversity is a necessary component of long-term forest management."*

Conservation of genetic diversity to allow future adaptation of species to new conditions and genetic selection of economically important traits is fundamental to a gene resource management program. Council's gene conservation objectives are met primarily through the Centre for Forest Gene Conservation (CFGC) in the Faculty of Forestry at UBC.[2] CFGC projects contribute to a five-part strategy of knowledge and technical development by increasing our understanding of: (1) the current extent of forest genetic resources, including species distributions, and the amount and distribution of genetic variation within species; (2) the degree to which species are conserved *in situ* in protected areas throughout their ranges;

[2] Web site: http://www.genetics.forestry.ubc.ca/cfgc.

(3) patterns of climatic or ecological variation that are likely to coincide with adaptive patterns of genetic variation and species ranges; (4) the extent of *ex situ* genetic resources, e.g., seed in storage; and (5) optimal sampling strategies for conserving genetic diversity through *in situ* and *ex situ* protection, particularly given the challenge of a rapidly changing climate. In addition, the CFGC investigates species-specific genetic issues associated with at-risk and rare tree species.

CFGC accomplishments in 2004/05 include:

- Completion of an evaluation of the *in situ* conservation status of all (49) indigenous tree species in BC by estimating representation in and outside designated Protected Areas.
- Completion of a fine-scale climate model for British Columbia that allows prediction of current and future annual and monthly climatic means for any location in BC. This model will allow applications such as predicting seed zone boundary change needs under various climate-change scenarios.
- Conservation research on non-timber species, included the completion of PhD research on whitebark pine genecology, inbreeding depression, and disease resistance, and the initiation of research on the genetic diversity patterns of Pacific dogwood and Garry oak.
- Publication of five journal articles and one encyclopedia article related to the gene conservation of BC tree species.

Project	Planned products	Products achieved
Theoretical framework	1 progress report	Progress report completed
Genetic issues in certification	1 update report	1 update report
Cataloguing and documenting *in situ* protection	53 SPUs / 90 landscape units	53 SPUs / 90 landscape units
Sampling strategies and SPZs	3 scientific papers	2 scientific papers accepted for publication; one in progress
Markers and theory for measuring diversity	1 final report	1 scientific paper
Whitebark pine diversity and conservation	1 progress report	1 progress report
Genetic structure of minor species	2 scientific papers	2 scientific papers in press
	1 working plan for *Cornus nuttalli*	1 working plan for *Cornus nuttalli*
Climate change and gene conservation	1 high resolution BC climate model	High resolution climate model completed
	2 scientific papers	2 scientific papers
Extension	100 clients served; / Web site updated	~200 clients served; 1400 unique visitors to Web site

Table 2
Summary of Gene Conservation projects, planned products and products achieved for the period April 1, 2004 through March 31, 2005.

3.3 Tree Breeding Subprogram

> *Tree breeding programs investigate genetic diversity patterns, test trees for genetic quality, and select parent trees for seed orchards.*

The Tree Breeding Subprogram seeks to understand and use the genetic variation of commercially and ecologically important tree species in B.C. This work includes genecology[3] research to develop seed transfer limits, and the continual improvement of the genetic worth (GW)[4] of seed and vegetative materials transferred to seed orchards. Tree breeding activities include selecting parents in wild stands, propagating, testing offspring, mating, establishing/maintaining/measuring trials, and associated research. The MOF Research Branch manages and carries out Tree Breeding Subprogram activities. FGC Interior and Coastal TACs, and their associated Species Committees, assist MOF tree breeders with planning for the Tree Breeding Subprogram.

Figure 5 shows the allocation of effort to Tree Breeding Subprogram activities in 2004/05. Figure 6 compares the work completed under each activity to work planned for the fiscal year.

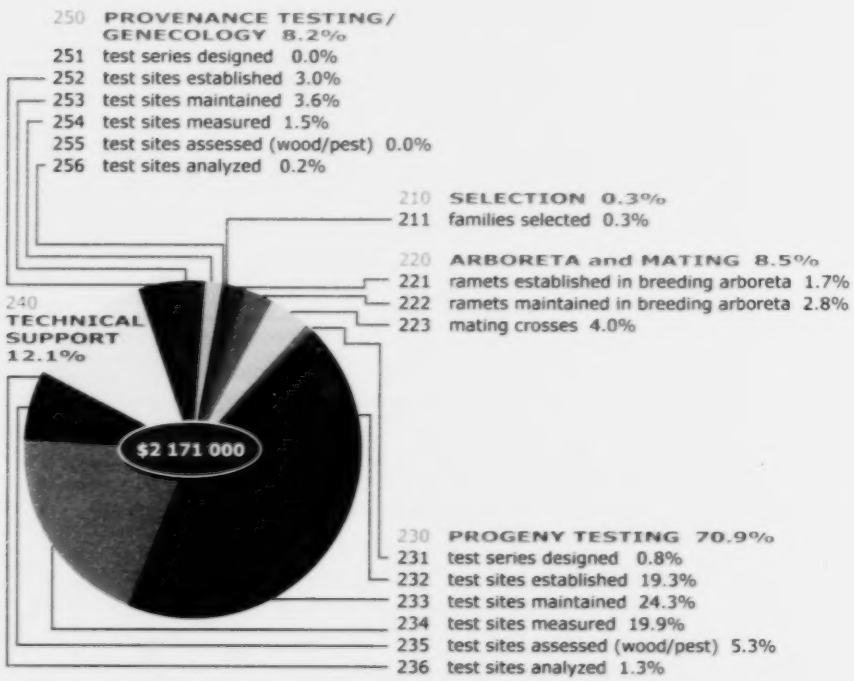

250 PROVENANCE TESTING/ GENECOLOGY 8.2%
251 test series designed 0.0%
252 test sites established 3.0%
253 test sites maintained 3.6%
254 test sites measured 1.5%
255 test sites assessed (wood/pest) 0.0%
256 test sites analyzed 0.2%
210 SELECTION 0.3%
211 families selected 0.3%
220 ARBORETA and MATING 8.5%
221 ramets established in breeding arboreta 1.7%
222 ramets maintained in breeding arboreta 2.8%
223 mating crosses 4.0%
240 TECHNICAL SUPPORT 12.1%
$2 171 000
230 PROGENY TESTING 70.9%
231 test series designed 0.8%
232 test sites established 19.3%
233 test sites maintained 24.3%
234 test sites measured 19.9%
235 test sites assessed (wood/pest) 5.3%
236 test sites analyzed 1.3%

Figure 5
Tree Breeding Subprogram allocation of effort, 2004/05.

[3] Genecology is the relationship between genetic diversity and environments.

[4] Genetic worth is a measure of the genetic quality of a seed or vegetative lot over wild stand material, measured for a specific trait (e.g., growth, wood density, pest resistance).

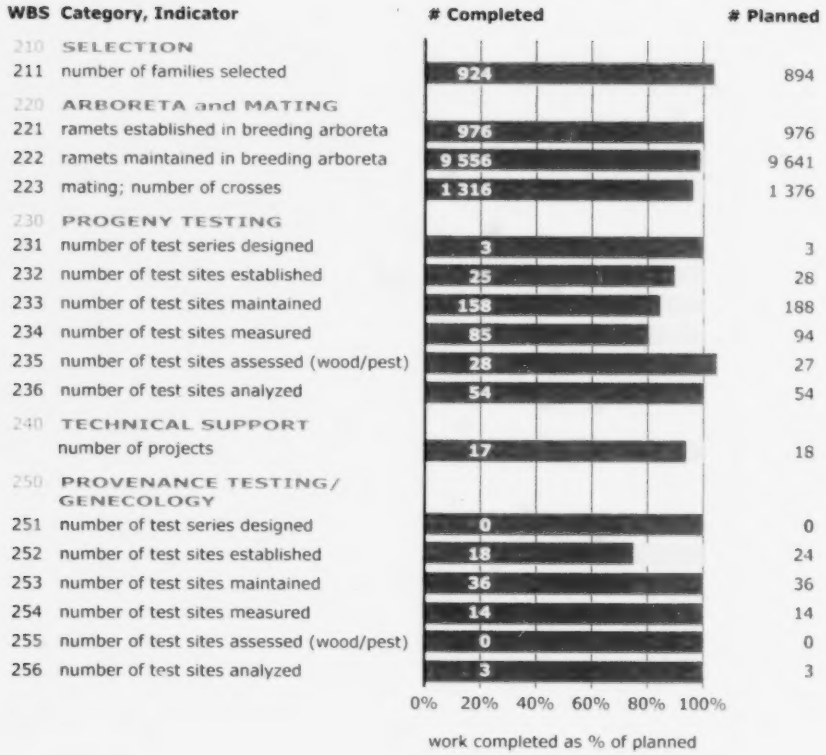


Figure 6
Tree Breeding Subprogram progress, 2004/05.

Progress in Operational Breeding

Operational breeding program objectives were met or exceeded for most seed planning units (SPUs) during the fiscal year. A substantial number of second-generation matings were carried out in interior spruce, Sitka spruce, interior Douglas-fir, coastal Douglas-fir and western larch, reflecting the continued shift of focus in many seed planning units to second generation (F1 and F2 – full-sib)[5] testing. During the year, maintenance was carried out on 194 sites, addressing much of the backlog of brushing and label upkeep needed. Ninety-nine tests were measured or assessed for a variety of traits, providing the data required for calculating parent-tree breeding values.

"Trees of high genetic quality are selected for seed production in seed orchards."

Interior Breeding Program Highlights

- 12 second-generation progeny tests of lodgepole pine and white pine were established.
- Lodgepole pine and western larch genetic realized-gain trials, with stand density and site index interactions, were established in the Thompson-Okanagan and Nelson seed zones, respectively.

[5] F1 – full-sib populations are the first generation of pedigree families where both parents of all offspring are known and selected for specific desirable traits. Most provincial programs started with open-pollinated testing in the first generation.

Coastal Breeding Program Highlights

- First-generation progeny test establishment for redcedar was completed, bring the number of parents in test to over 900.
- Redcedar wood rot resistance properties continue to be investigated through study of tropolone type and concentrations.
- Douglas-fir wood density was assessed on 15 older progeny test sites to better understand density by site-quality interactions, as well as family performance for wood quality.

"First-generation test establishment was completed for redcedar, bringing the number of parents in test to over 900."

Provenance Testing and Genecology

Provenance testing and genecology work guide seed transfer, and provide an information base for decisions related to the deployment of genotypes in the provincial reforestation program. Increasingly, genecology data are linked to climate-change modeling and response. Highlights include:

- Initiation of the largest genecology study of interior spruce ever undertaken in western North America. One hundred populations from New Mexico (latitude 35°N) to the Northwest Territories (latitude 65°N) will be tested with 27 seed orchard (Class A) and improved populations at 15 test sites in B.C., Alberta, and the Yukon. Sites were located and prepared, seedlings lifted, and site planting began in the spring of 2005. This project is partially funded by the Climate Change Action Fund of Environment Canada.
- Measurement and maintenance of tests of sub-alpine fir, alder, and big-leaf maple were carried out.

"Planting started on the largest spruce genecology study undertaken in North America."

3.4 Operational Tree Improvement (OTIP) Subprogram

The OTIP Subprogram focuses on increasing the quality and quantity of seed produced from provincial seed orchards. It also provides technical support to improve orchard production and management.

"OTIP focuses on increasing the quality and quantity of seed produced from existing seed orchards."

OTIP projects are developed through a call-for-proposals that is based on Species Plan priorities. FGC Review Committees rank all proposals against FGC objectives and SPU priorities, based on technical merit, impact, value, and cost. The MOF Tree Improvement Branch administers the OTIP Subprogram on behalf of the Forest Investment Account and the FGC.

Figure 7 shows the allocation of funding to OTIP Subprogram activities in 2004/05. Figure 8 compares the work completed under each activity to work planned for the fiscal year. Funding levels for the OTIP Subprogram have declined in each of the past 5 years due to the completion of a substantial backlog of orchard upgrading and to the successful completion of technical support projects.

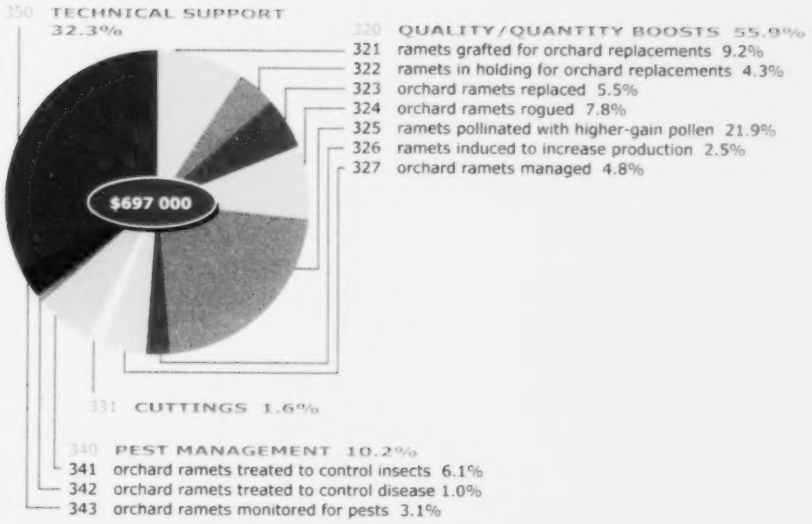

350 TECHNICAL SUPPORT
32.3%
$697 000
320 QUALITY/QUANTITY BOOSTS 55.9%
321 ramets grafted for orchard replacements 9.2%
322 ramets in holding for orchard replacements 4.3%
323 orchard ramets replaced 5.5%
324 orchard ramets rogued 7.8%
325 ramets pollinated with higher-gain pollen 21.9%
326 ramets induced to increase production 2.5%
327 orchard ramets managed 4.8%
330 CUTTINGS 1.6%
340 PEST MANAGEMENT 10.2%
341 orchard ramets treated to control insects 6.1%
342 orchard ramets treated to control disease 1.0%
343 orchard ramets monitored for pests 3.1%

Figure 7
OTIP Subprogram allocation of effort, 2004/05.

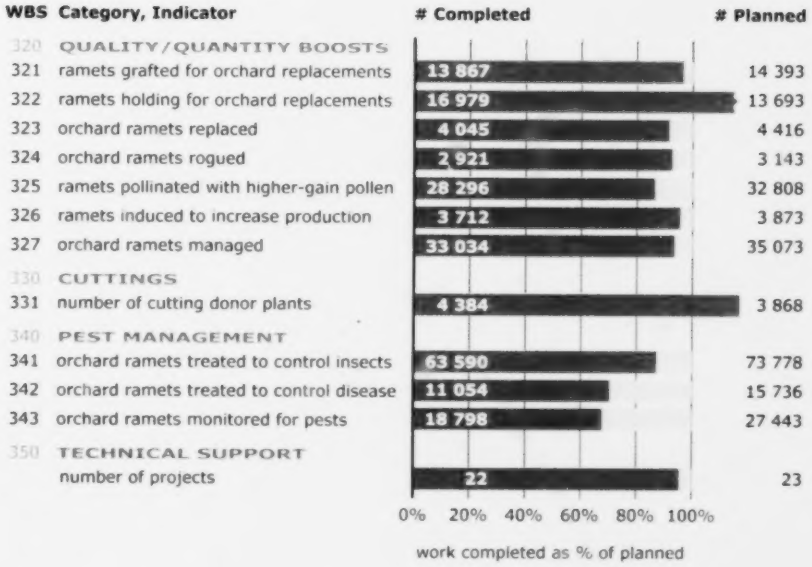

WBS Category, Indicator
Completed
Planned
320 QUALITY/QUANTITY BOOSTS
321 ramets grafted for orchard replacements 13 867 14 393
322 ramets holding for orchard replacements 16 979 13 693
323 orchard ramets replaced 4 045 4 416
324 orchard ramets rogued 2 921 3 143
325 ramets pollinated with higher-gain pollen 28 296 32 808
326 ramets induced to increase production 3 712 3 873
327 orchard ramets managed 33 034 35 073
330 CUTTINGS
331 number of cutting donor plants 4 384 3 868
340 PEST MANAGEMENT
341 orchard ramets treated to control insects 63 590 73 778
342 orchard ramets treated to control disease 11 054 15 736
343 orchard ramets monitored for pests 18 798 27 443
350 TECHNICAL SUPPORT
number of projects 22 23
0% 20% 40% 60% 80% 100%
work completed as % of planned

Figure 8
OTIP Subprogram progress, 2004/05.

Activities

OTIP projects generally met expectations[6]. Propagation (WBS 321) was higher than planned due to additional work with western redcedar to develop an inventory of ramets that may be selected for immediate use in orchards as breeding values come available from progeny tests. Pest

[6] For additional detail on projects, see the *Tree Improvement Program Project Report for 2004/05*.

management activities (WBS 340) were less than planned due to a relatively small cone crop that did not require the anticipated level of pest management activity. Supplemental mass pollination and control-pollination activities also did not meet planned numbers, primarily for red cedar and interior spruce (Peace River), due to lower than anticipated flowering.

Technical support projects proceeded as planned, with two projects added during the fiscal year to meet key needs. This additional work took advantage of unused funds from other projects. A total of 22 projects proceeded as planned, and addressed issues such as increasing seed set in lodgepole pine orchards, pest management measures, investigating selfing rates in interior spruce orchards, and improving yellow cedar pollen handling and seed set.

3.5 Expansion of Orchard Seed Supply Subprogram (SelectSeed Company Ltd.)

"SelectSeed's investments are based on planning processes led by Council."

SelectSeed Company Ltd. is wholly owned by the B.C. Forest Genetics Society and reports to the FGC. SelectSeed's mandate is to develop and manage orchard expansions needed to meet FGC objectives, and to produce seed of high genetic quality for use in provincial reforestation programs. SelectSeed also provides program management services to the FGC.

SelectSeed's Business Plan and investments are based on the long-term and annual business plans prepared by FGC TACs and Species Committees. Management discretion lies with the SelectSeed Board of Directors, and is guided by the terms of the multi-year agreement between SelectSeed and the Province of British Columbia. The SelectSeed Business Plan is reviewed and approved annually by the FGC. Selectseed has entered into contracts with private orchard companies to develop and manage needed seed orchards.

SelectSeed Mission Statement

SelectSeed supports Forest Genetics Council objectives for the development of seed orchard facilities to meet the provincial demand for high quality, ecologically adapted tree seed through investments, cooperative work with FGC members, and effective program management.

Figure 9 shows funding allocations to the Subprogram activities in 2004/05. Figure 10 compares the work completed under each activity to work planned for the fiscal year.

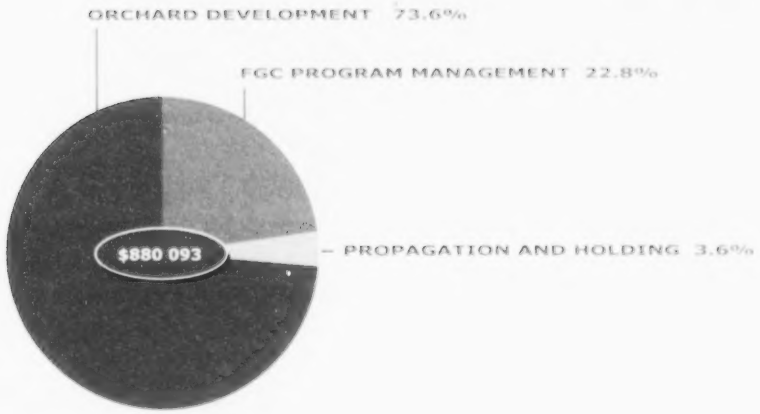


Figure 9
Expansion of Orchard Seed Supply Subprogram allocation of effort, 2004/05.

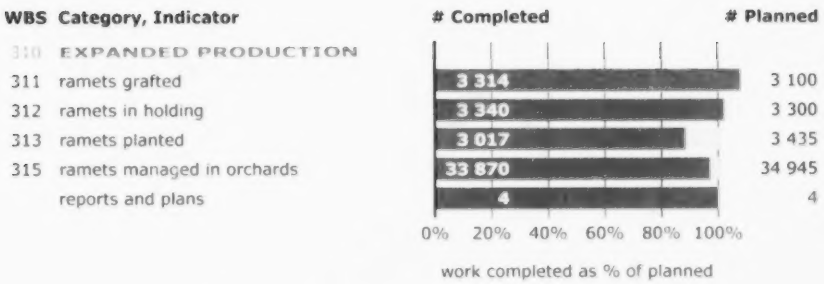


Figure 10
Expansion of Orchard Seed Supply Subprogram progress, 2004/05.

Orchard Development and Production

In its fifth year of operation, SelectSeed focused on managing 14 orchard contracts and on propagation to complete orchard development. No new orchards were initiated during the year. Over 3,000 ramets were planted, bringing the total number of ramets established across the 14 orchard developments to over 33,000 of 35,320 planned (95%). A small crop was collected from orchard 321 - Douglas-fir NE low.

SelectSeed Ltd. Management

SelectSeed activities in 2004/05 included:

- organizing and managing contracts for the propagation and holding of stock;
- managing orchard contracts, including planning, support for orchard contractors, stock allocations, workplan development, and records maintenance;
- preparing an annual Business Plan covering business procedures, budgets, and long- and short-term activities;

> *"In its fifth year of operation, SelectSeed orchard developments increased to over 33,000 ramets."*

- reporting to FIA administrators on accounts and activities; and
- managing accounts and corporate business.

FGC Program Management

FGC program management activities included developing the FGC Business Plan for 2004/05; organizing committee work for development of the 2005/06 FGC Business Plan; policy, committee, issue management, and reporting for the FGC; updating species plans; and coordinating FGC activities.

3.6 Extension and Communication Subprogram

The Extension and Communication Subprogram supports FGC goals and objectives through extension, communication, and education activities. These activities are developed and guided by the FGC Extension Technical Advisory Committee (ETAC), which includes representatives from government, industry, seed dealers, academia, and consultants.

Figure 11 shows funding allocations to the Extension and Communication Subprogram activities in 2004/05.

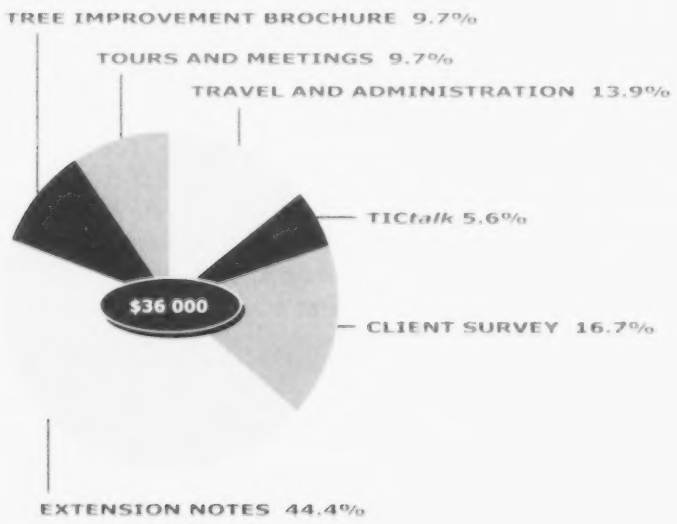


Figure 11
Extension and Communication Subprogram allocation of effort, 2004/05.

FGC Program Extension

In 2004/05 the extension note *The Benefits of Using Selected Reforestation Materials* was completed. Preparation of three additional extension notes were initiated, and updates to the brochure "*Tree Improvement in British Columbia*" were completed. An edition of the FGC newsletter, *TICTalk*, was prepared, with final publication slated for June of 2005.

A field workshop was held in the Nass – Skeena area, featuring genetic issues primarily with spruce and lodgepole pine. Attendance by a mix of field staff and forest genetics specialists provided for a highly productive mix.

A survey to better understand client needs and means of meeting those needs was prepared and circulated in conjunction with FORREX. Results were compiled, and will be discussed in a workshop to be held in June, 2005. Information from survey, and decisions from the workshop will guide extension priorities in the coming years.

> "*The Extension and Communication Subprogram activities serve public, technical, and decision-making audiences.*"

3.7 Gene Resource Information Management Subprogram

The Gene Resource Information Management Subprogram supports the development of tree gene resource registries and land-based gene resource management (GRM) and planning tools. These tools will improve client access to gene resource information to support genetically selected seed use for reforestation, incorporate genetic gain into timber supply analyses, support seed deployment and gene conservation strategies, and develop land-based effectiveness monitoring programs.

A Steering Committee develops Gene Resource Information Management activities and budgets. The Committee—comprised of MOF tree improvement, research, and systems staff; industry representatives; and the FGC Program Manager—identifies projects and sets priorities for FGC approval. The Tree Improvement Branch administers the subprogram on behalf of the MOF's Forest Investment Account (FIA).

A planned project to conduct a gene resource management gap analysis was deferred due to MOF staff re-assignments to meet implementation targets for the Chief Forester Standards for Seed Use. Deferral of this project resulted in $20,000 being turned back for reallocation to other program needs.

Figure 12 shows funding allocations to the Gene Resource Information Management Subprogram activities in the 2004/05 fiscal year.

> "*The Gene Resource Information Management Subprogram develops tree gene resource registries and information management tools to assist seed users.*"

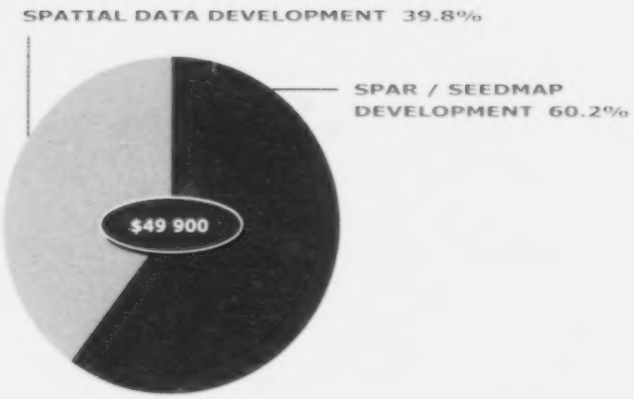


Figure 12
Gene Resource Information Management Subprogram allocation of effort, 2004/05.

Accomplishments

- Strategic planning for the development of a provincial gene resource information strategy was initiated.
- A web-based parent tree registry and on-line registration were developed in support of the new Chief Forester's Standards for Seed Use. Both features will be accessible through the Seed Planning and Registry system (SPAR) (MOF funded).
- Seed planning zone/unit gene resource management data were updated, including development of new tested parent tree area-of-use data in support of the Chief Forester's Standards for Seed Use.
- An analysis of issues related to the realignment of seed planning zones with new BEC boundaries was undertaken to assess data dependencies and project scope.
- Mapping and resource attribute criteria development for superior provenances was initiated.
- Easy-to-view and printable theme maps were developed for SeedMap.
- SeedMap enhancements, including access to new resource data sets and the development of seed use and deployment queries, were done in support of effectiveness evaluation and monitoring.

3.8 Seed Orchard Pest Management Subprogram

The Seed Orchard Pest Management Subprogram supports research, applied support, and pest management operations to increase orchard yields of high quality seed. The Orchard Pest Management Technical Advisory Committee (OPM-TAC) guides investments and activities.

During the period of this report, the FGC recognized that orchard pests were the primary limitation to meeting objectives for select seed use and genetic worth. Consequently, Council mandated the OPM-TAC to review pest management needs and delivery mechanisms, and to propose program changes to more effectively meet those needs. In March of 2005, Council recognized the need for a three-level approach to pest management, including basic and applied research by dedicated research staff, applied support from highly qualified pest management specialists, and operational delivery by orchard operations. Consequently, Council approved a program budget in support of this approach, and a dedicated orchard pest management research scientist will be recruited within the Ministry of Forests during the 2005/06 fiscal year.

> *"The FGC recognized that orchard pests were the primary limitation to meeting objectives for select seed use and genetic worth."*

In addition to this significant subprogram reorganization effort, contract research was supported, and a new call for proposals was managed. Research projects undertaken during 2004/05 fiscal year resulted in the following accomplishments.

Research Accomplishments

- A collaborative project with the B.C. Ministry of Forests, the Canadian Forest Service, and the University of California is developing a pheromone attractant for fir coneworm (*Dioryctia abietivorella*). This insect is responsible for catastrophic losses in many Interior seed orchard crops. A major breakthrough in identifying the pheromone occurred in 2004. Pheromone blend and optimum dosage rates will be determined in 2005 field trials.
- The western conifer seed bug (*Leptoglosssus occidentalis*) is viewed as a principal pest of seed production, especially in lodgepole pine orchards. Control mechanisms are limited. Research on the identification of male communication signals through both pheromones and sonic signals was planned for 2004, but health and logistical problems hampered this effort. This project will continue in 2005 without FGC funding.
- A collaborative project between the B.C. Ministry of Forests, Canadian Forest Service, and Institut National de Recherches Agronomiques (France) proceeded on the identification of species and ranges of seed chalcids (Megastigmus spp.), and on the identification of parasitoid insects. Seed samples were obtained from approximately 33 natural-stand and orchard seedlots. Insects from infested samples are being reared and analyzed to identify species and parasitoids.

- Fungal assays were conducted on 183 seedlots stored at the Provincial Seed Centre for three fungal species common in seedling nurseries. Results were made available to seed users to help increase nursery recoveries.

3.9 Administration

Administration of Forest Investment Account Tree Improvement Program funding is carried out by the MOF Tree Improvement Branch, and includes financial, monitoring, and reporting services. The administrative infrastructure for the Tree Breeding, OTIP, Extension and Communication, and Gene Resource Information Management Subprograms is provided directly. Administration of the Gene Conservation and Orchard Expansion Subprograms is carried out under contract.

4.0 Provincial Progress Indicators

Two of the principal objectives in the FGC Strategic Plan are to increase the average volume gain (genetic worth for growth, or GWg) of select seed to 20% by 2020, and to increase select seed use to 75% of total provincial sowing by 2013. Figures 13 and 14 show, respectively, actual and forecast values for select seed/rooted cutting use and GWg for the period 1995–2024.[7]

Forecasts indicate that actual GWg (Figure 13) and seed use (Figure 14) are on track.

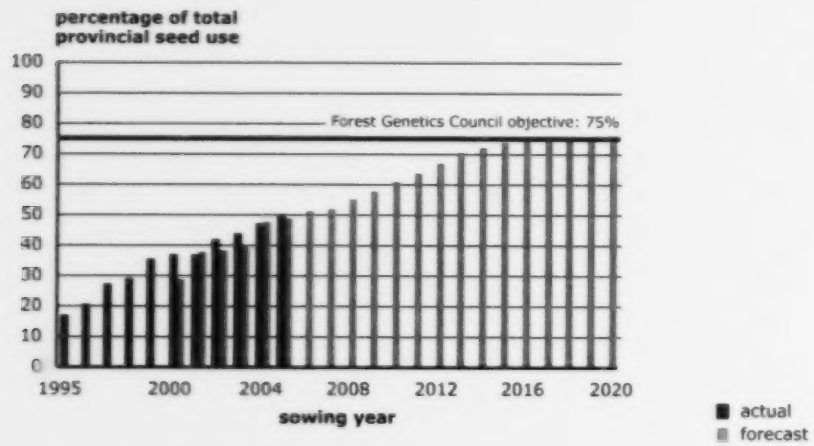


Figure 13
Actual and Species Plan forecasts of select seed production as percentage of provincial seed use.

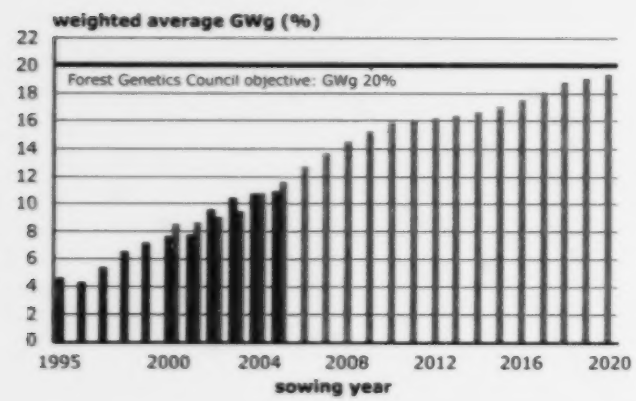


Figure 14
Actual and Species Plan forecasts of average genetic worth for growth (GWg) of select seed in B.C.

[7] Until 2001, the term "select seed" referred to orchard seed with GW > 0. In 2001, the definition was expanded to include B+ seed (GW > 0). As a result, actual values in Figures 15 and 16 for 2000 and beyond include B+ seed.

During the 2005 sowing year, select seed use accounted for nearly 50% of total sowing; roughly equal to 2004 (Figure 13). This included about 40% orchard seed (class A), and 9.8% superior provenance seed (class B+). Although on a percentage basis, the year over year increase in select seed use is small, total provincial use of select seed increased by about 15 million seedlings to 127 million in 2005. Total seedling orders were about 10% higher in 2005 (257 million vs. 235 million in 2004). This increase was primarily for lodgepole pine and interior Douglas-fir; species with limited orchard production at this time.

Projected use of orchard seed will continue to rise, mainly due to an expected increase in the supply of lodgepole pine and interior Douglas-fir seed from new orchards established during the last four years through SelectSeed Company Ltd., and by the Ministry of Forests.

"In 2004, provincial seed orchards produced sufficient seed for 51 million seedlings."

The rising average GWg of orchard seed used (figure 14) is primarily due to high-gain interior spruce and western larch orchard production. This average will continue to rise as interior Douglas-fir orchards come on stream, and as the new high-gain lodgepole pine orchards ramp up production. These gains reflect the effort of breeders to provide recommendations and improved materials, and of seed orchard managers to upgrade orchards. The OTIP Subprogram is instrumental in supporting this ongoing orchard upgrades.

During 2004/05, orchards established under contract to SelectSeed Company Ltd. neared completion. These orchard sites are now 95% planted, with over 33,000 ramets established as of March 31, 2005.

4.1 2004 Orchard Seed Crops

In 2004, all provincial orchards produced a combined crop of 616 kilograms of seed, sufficient to grow approximately 51 million seedlings (Table 3; Appendix 2). Crops from most orchards were down from 2003 due to a poor cone year throughout both the interior and coast. An exception was interior Douglas-fir, where maturing orchards and improved crop management technique resulted in a larger crop than the previous year.

Table 3
Summary of 2004 seed crops from all provincial orchards.

Species	Seed produced (kg)	Seedling equivalents (million)
Interior spruce	188.3	24.4
Lodgepole pine	84.6	9.7
Western larch	87.8	7.1
Interior Douglas-fir	11.7	0.4
White pine	46.8	0.8
Western redcedar	3.2	0.7
Coastal Douglas-fir	190.0	7.2
Western hemlock	3.4	0.5
	615.9	50.8

5.0 The Year Ahead

Gene resource management in British Columbia is now a fully integrated cooperative program with gene conservation, breeding, seed production, and various support functions. However, with difficult market conditions, forest health issues, corporate mergers, and other new challenges, the only thing that is consistent is change. While the program is functioning well on the whole, responding to new circumstances will test the Council affiliation. Some significant issues in the year(s) ahead include:

- The massive mountain pine beetle epidemic impacting lodgepole pine throughout the interior has dramatically changed harvest patterns, and will result in significant changes to allowable annual cuts in many management units in the mid- to long-term. Mitigation of cut reductions through the use of select seed will require a thorough understanding of harvest patterns, reforestation response, and future seed needs. As this information is obtained, changes will be needed in seed orchards.

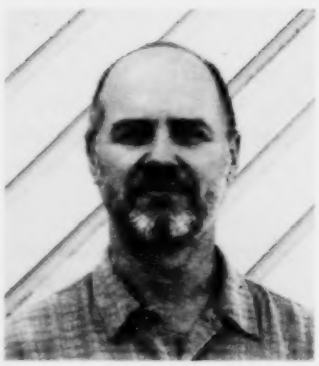
- Maturing orchards and breeding programs create opportunities to upgrade orchard genetic quality. Upgrades often result in reduced seed production, directly impacting the cash-flow of an orchard business. This may work in opposition to the optimization of gain transfer from breeding programs to plantations. Orchard managers and FGC-led committees must develop upgrading plans that meet both orchard cash-flow and timber-productivity needs.

- Seed and cone losses to pests remain a significant impediment to meeting FGC objectives. Expansion of the Pest Management Subprogram to include a scientist focused on cone and seed pest issues will begin to provide more control options. Orchard managers will be challenged to apply the best possible methods to control losses to pests.

- Increasing amounts of lodgepole pine orchard seed will be used over the next five years. Extension issues related to nursery production, planting stock quality, and field performance must be addressed to ensure gains are effectively transferred, reforestation costs are kept down, and field foresters are confident in the choice of orchard seed.

6.0 People

Shane Browne-Clayton, RPF



In May of 2005 Shane retired from his role as industry of Co-chair of the Forest Genetics Council; a position held since 1998. His tenure also included the period 1996 to 1998 when an Interim Council, selected by the then Provincial Chief Forester, Larry Pedersen, was charged with re-organizing the delivery of a provincial gene resource management program.

During his time with Council, Shane made a substantial contribution to the establishment of a well-supported cooperative program. His insight, patience, and hard work were instrumental to program success.

Prior to becoming FGC Co-Chair, Shane was actively involved with the Interior Tree Improvement Council and the Interior Technical Advisory Committee.

Shane's retirement from Council coincides with his retirement from Tolko Ltd., and previously Riverside Forest Products. His active involvement on Council and his ready willingness to find cooperative solutions will be missed. Shane will continue as a member of the SelectSeed Company Ltd. Board of Directors.

Appendix 1. Seed planning units

Seed planning unit (SPU)				Annual planting[8] (millions)	Program category[9]
#	Species	SPZ	Elev. band (m)		
1	Fdc	M	1-700	9.3	1
2	Cw	M	1-600	7.5	1
3	Hw	M	1-600	1.7	1
4	Sx	NE	800-1500	4.5	1
5	Sx	NE	1500-1900	5.4	1
6	Ss	M	1-500	1.1	1
7	Pli	NE	700-1400	3.7	1
8	Pw	M/SM	1-1400	0.3	1
9	Ba	M	1-1000	1.4	3
10	Pli	TO	700-1400	13.6	1
11	Yc	M	1-1100	1.4	1
12	Pli	PG	700-1200	30.0	1
13	Lw	NE	700-1400	3.0	1
14	Sx	PG	600-1200	25.2	1
15	Pw	KQ	500-1400	1.0	1
16	Pli	TO	1400-1600	5.3	2
17	Pli	BV	700-1200	16.4	1
18	Pli	CP	700-1100	7.2	1
19	Fdc	SM	200-1000	1.4	2
20	Pli	NE	1400-2000	3.1	3
21	Fdi	NE	400-1000	2.5	1
22	Fdi	NE	1000-1600	3.4	2
23	Sx/Ss	SM/NST	all	0.8	3
24	Hw	M	600-1100	1.0	2
25	Sx	EK	750-1700	1.9	1
26	Pli	PG	1200-2000	3.2	3
27	Cw	SM	200-1000	0.7	3
28	Sx	TO	1300-1900	3.3	1
29	Pli	EK	1500-2000	1.9	3
30	Sx	TO	700-1300	1.2	2
31	Fdc	M	700-1200	1.4	2
32	Pli	EK	800-1500	2.7	2
33	Cw	M	600-1500	1.3	2
34	Lw	EK	800-1500	2.0	1
35	Sx	BV	500-1200	9.5	1
36	Bg	M	1-700	0.1	3
37	Fdi	QL	700-1200	0.5	2
39	Fdi	EK	700-1400	0.9	2
40	Sx	PR	650-1200	6.4	2
41	Fdi	PG	700-1000	2.2	2
42	Sx	PG	1200-1550	2.6	2
43	Fdi	CT	600-1200	0.9	2
44	Sx	NE	1-1000	1.2	2
45	Pli	BB/CHL	all	13.4	3
46	Bl	all int.	all	1.9	3
47	Bn	M	all	0.1	3
48	Aspen/birch/ poplar	Interior	-	NA	3
49	Alder/poplar/ maple	Coast	-	NA	3
50	Lw	NE	1200-1800	1.2	2

[8] Annual planting based on 5-year average sowing (2001-2005 sowing years)

[9] Program categories: 1.Advanced-generation program, 2. First-generation program, 3. genecology only, 4. no genetics program.

Appendix 2. Summary of 2004 seed orchard crop production

Species	SPU	Orch. #	Producer	GWg	Cones (hL)	Seed (g)	Estimated # seedl. (x1000)
Redcedar	M 1-600m	140	Twest – Mt. Newton	G +07	8.50	1,200	214.8
Redcedar	M 1-600m	184	MOF - Saanich	G +05	1.84	2,005	483.2
Coastal Douglas-fir	M 1-700m	149	MOF - Bowser	G +07	249.25	99,493	3,848.8
Coastal Douglas-fir	M 1-700m	162	MOF - Bowser	G +19	5.25	464	18.3
Coastal Douglas-fir	M 1-700m	162	MOF - Bowser	G +12	150.50	53,577	2,269.9
Coastal Douglas-fir	M 1-700m	183	Twest – Mt. Newton	G +18	2.00	844	27.0
Coastal Douglas-fir	M 1-700m	183	Twest – Mt. Newton	G +14	17.00	7,208	263.5
Coastal Douglas-fir	M 1-700m	154	Twest – Mt. Newton	G +11	28.00	3,938	95.4
Coastal Douglas-fir	M 1-700m	154	Twest – Mt. Newton	G +07	29.00	2,568	65.9
Coastal Douglas-fir	M 1-700m	134	Twest – Mt. Newton	G +12	31.30	6,018	181.5
Coastal Douglas-fir	M 1-700m	134	Twest – Mt. Newton	G +07	12.70	1,666	42.3
Coastal Douglas-fir	M 1-700m	169	WFP - Saanichton	G +10	20.30	6,105	168.9
Coastal Douglas-fir	M 114-814m	166	WFP - Saanichton	G +11	12.50	2,721	68.4
Coastal Douglas-fir	M 1-700m	166	WFP - Saanichton	G +09	19.70	4,360	121.5
Coastal Douglas-fir	M 1-700m	177	CFP - Sechelt	G +18	6.00	1,042	29.3
Interior Douglas-fir	NE 400-1000m	321	PRT - Grandview	G +28	1.50	324	6.3
Interior Douglas-fir	QL 600-1350m	226	VSOC	G +24	13.40	5,700	193.6
Interior Douglas-fir	CT 600-1350m	231	VSOC	G +13	24.80	5,647	189.7
Western hemlock	M 600-1100m	130	Twest – Mt. Newton	G +05	3.25	1,205	203.3
Western hemlock	M 1-600m	182	Twest – Mt. Newton	G +14	2.00	406	57.8
Western hemlock	M 600-1100m	196	MOF - Saanich	G +08	0.63	373	70.5
Western hemlock	M 1-600m	170	WFP - Saanichton	G +14	1.10	618	66.2
Western hemlock	M 1-600m	133	CFP - Sechelt	G +15	10.00	807	117.9
Western larch	NE 700-1400m	332	MOF - Kalamalka	G +32	32.20	27,247	1,722.6
Western larch	EK 800-1500m	333	MOF - Kalamalka	G +13	61.40	60,570	5,340.2
Lodgepole pine	TO 1100-1600m	310	Tolko - Eaglerock	G +14	14.00	1,064	142.6
Lodgepole pine	TO 750-1400m	308	PRT - Grandview	G +06	43.90	9,069	917.3
Lodgepole pine	TO 750-1400m	311	PRT - Grandview	G +15	46.60	10,336	1,081.9
Lodgepole pine	NE 650-1400m	313	PRT - Grandview	G +16	33.20	6,816	647.7
Lodgepole pine	NE 650-1400m	307	MOF - Kalamalka	G +07	79.30	19,677	2,202.0
Lodgepole pine	PGN 650-1400m	307	MOF - Kalamalka	G +07	10.10	1,833	251.1
Lodgepole pine	PG 700-1200m	220	MOF - Prince George	G +06	15.20	5,357	579.7
Lodgepole pine	CP 600-1100m	223	MOF - Prince George	G +06	7.20	2,847	289.7
Lodgepole pine	BV 700-1200m	228	MOF - Prince George	G +06	15.60	6,207	733.1
Lodgepole pine	BV 700-1200m	219	VSOC	G +12	92.50	15,728	2,097.0
Lodgepole pine	PG 700-1200m	222	VSOC	G +09	31.25	3,865	493.0
Lodgepole pine	CP 700-1100m	218	VSOC	G +09	29.75	1,833	234.6
Western white pine	KQ	335	MOF - Kalamalka	G +02	18.20	1,805	32.6
Western white pine	M 1-1000m	403	Twest – Mt. Newton		11.00	3,594	71.6
Western white pine	GL, M, SM 1-1000m	175	MOF - Saanich		45.20	23,055	435.6
Western white pine	M 1-1000m	174	CFP - Sechelt		39.00	18,386	297.6
Sitka spruce	M 1-500m	195	Yellowpoint Prop.	R +??	1.00	79	10.3
Interior spruce	EK 760-1700m	304	MOF - Kalamalka	G +27	37.50	23,577	2,226.3
Interior spruce	NE 800-1550m	305	MOF - Kalamalka	G +14	33.40	14,201	2,242.3
Interior spruce	NE 1450-2000m	306	MOF - Kalamalka	G +12	39.50	30,044	4,176.2
Interior spruce	BV 500-1200m	620	MOF - Kalamalka	G +27	7.60	3,371	483.5
Interior spruce	BV 600-1200m	208	MOF - Skimikin	G +10	14.80	6,377	919.2
Interior spruce	PG 610-1200	214	VSOC	Varies*	179.80	110,715	14,356.7

*** collected as family lots; GW varies**

Forest Genetics Council of BC

Name	Affiliation	Representing	Name	Affiliation	Representing
Shane Browne-Clayton	Riverside For. Prod.	Industry Co-Chair	Mark Hopkins	Ainsworth Lumber	Interior industry
Dr. Dale Draper	Ministry of Forests	MOF Co-Chair	Walter Matosevic	Can. Forest Prod.	Int. industry orchards
Dr. Sally Aitken	University of BC	Coast TAC	Diane Medves	Weyerhaeuser	Coast industry
Dr. John Barker	University of BC	Coast industry	Al McDonald	BC Timber Sales	MOF and BCTS
Dr. Michael Carlson	Ministry of Forests	Interior TAC	Mike Madill	Ministry of Forests	Ministry of Forests
Frank Gundersen	Abitibi Consolidated	N. interior industry	Dr. Alvin Yanchuk	Ministry of Forests	Ministry of Forests
Dr. Chris Hawkins	Univ. of Northern BC	University	Henry Benskin	Ministry of Forests	FIA (non-voting)
Gary Hogan	Can. Forest Serv.	Can. Forest Serv.			

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Mike Madill	Ministry of Forests		

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Charlie Cartwright	Ministry of Forests	Jill Peterson	Ministry of Forests
Keith Cox	Ministry of Forests	Doug Stables	Trust for Sustainable Forestry
Tim Crowder	TimberWest	Kathie Swift	FORREX
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